

[54] FIRE ESCAPE DEVICE

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[58] Field of Search..... 182/5, 6, 7; 188/65.1, 65.2

[56] References Cited

UNITED STATES PATENTS

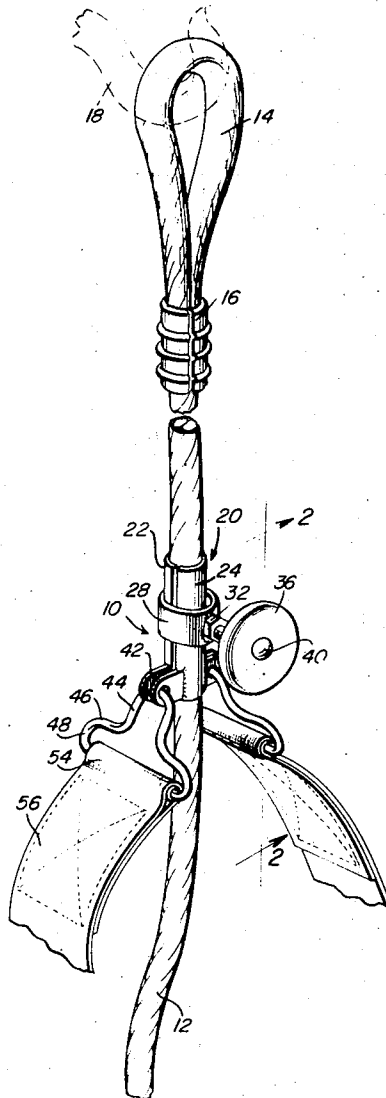
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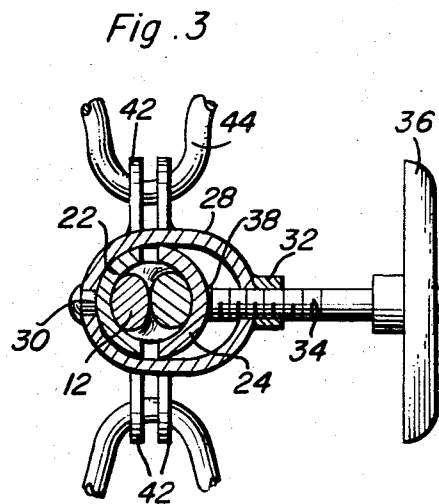
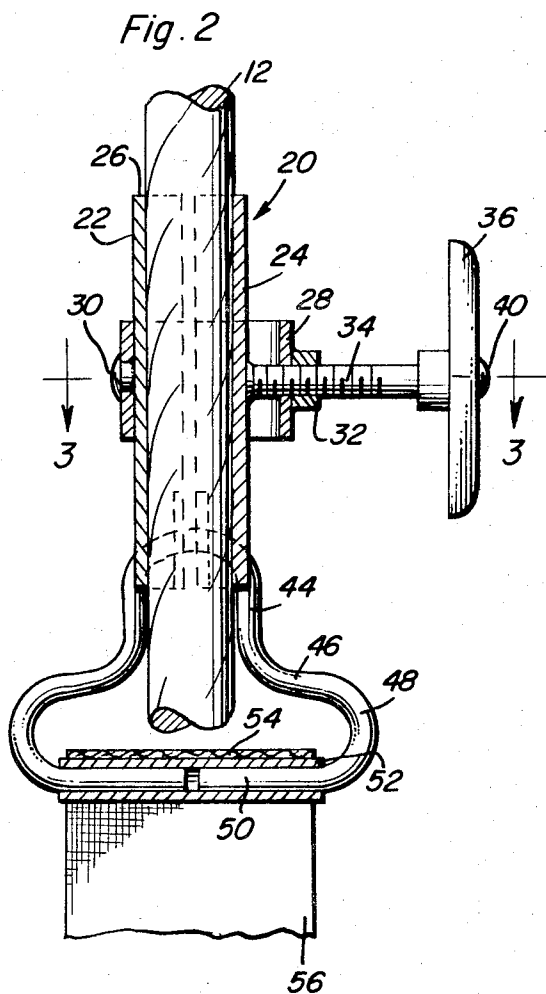
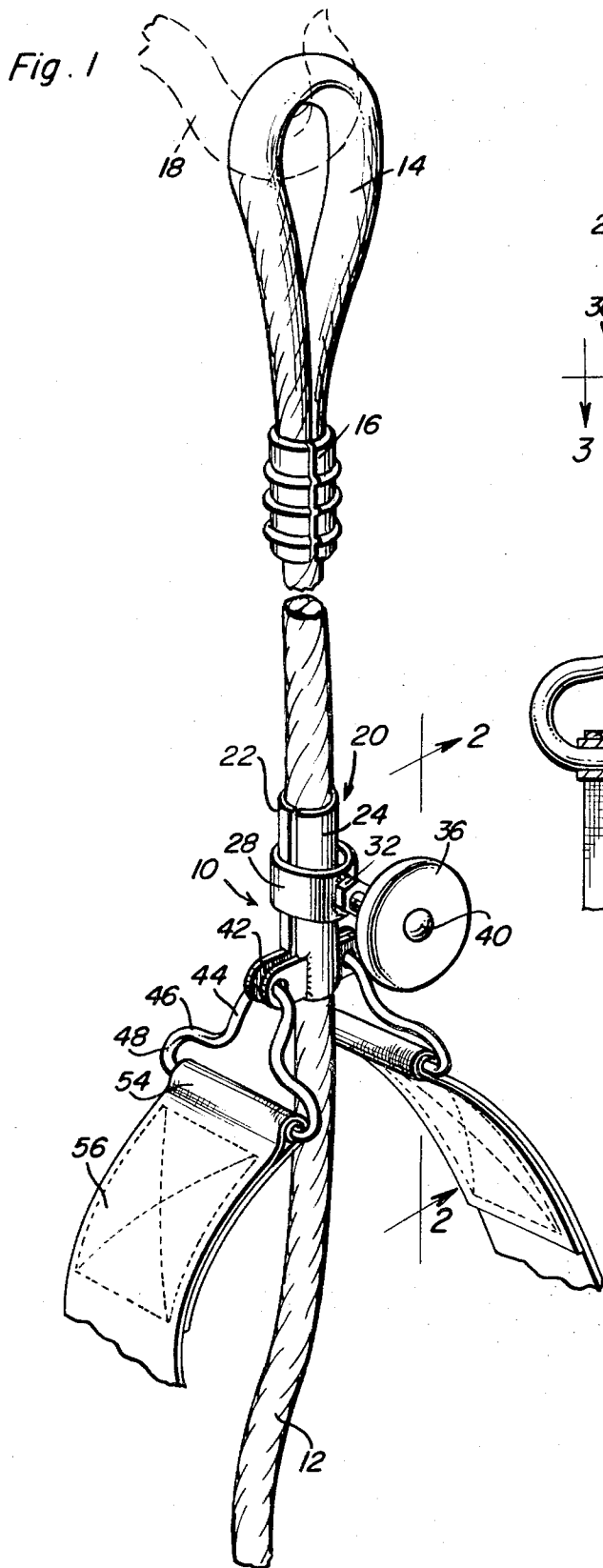
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[57] ABSTRACT

A fire escape in the form of an elongated flexible rope having a loop formed at one end thereof for connection with a component of the building structure, bracket, or other stationary device preferably located interiorly of a building structure, room, or the like, with the rope extending through a window or other opening and being of sufficient length to reach to the ground. A slidable, manually actuated device is mounted on the rope for longitudinal sliding movement in relation thereto with the rate of movement or descent being manually controlled by a person supported therefrom by the use of a flexible sling. The rate of descent is controllable by a screw-type rope clamping device which frictionally grips the rope for controlling the descent of a person along the rope.

8 Claims, 3 Drawing Figures





FIRE ESCAPE DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to a fire escape and, more particularly, a portable window fire escape device, which enables persons trapped in the interior of a building, such as a room, or the like, to safely descend from the building.

2. Description of the Prior Art

There have been many instances of fatal injuries occurring due to being trapped in the interior of a building above the ground floor. Many buildings are equipped with permanent fire escape stairways, but it sometimes occurs that access to such fire escape stairways is not possible which has resulted in preventable injury and loss of life. In my prior U.S. Pat. No. 3,504,763, there is disclosed a fire escape device in the form of an elongated rope that is anchored to a portion of a building and a sleeve that is slidable thereon and provided with a sling for supporting a person with the structure providing for a manual control of the rate of descent. In that structure, the sling is removably connected to a sleeve which required that the person using the device attach a loop into the hook on the sleeve thus applying the force directly to the sleeve with only a manually controlled clamp member on the sleeve serving to apply braking force to the rope.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a portable window fire escape incorporating an elongated flexible rope and a sliding sleeve assembly mounted thereon which includes a pair of rope engaging members to which a sling is permanently attached with the weight exerted on the sling by the occupant thereof serving to cause at least a partial frictional drag on the rope, thereby eliminating any possibility of disconnection of the sling from the sleeve while exiting from a window, or the like, and enhancing the braking action on the rope.

In addition, the fire escape of this invention includes a ring encircling the two rope engaging members with the ring being permanently attached to one of the members and receiving a screw threaded actuator for the other of the members to enable variation in the braking action on the rope.

A further object of the invention is to provide a portable window fire escape that is relatively inexpensive to manufacture, easy to utilize, dependable and safe in operation and capable of being neatly and compactly stored when the use thereof is not required.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the portable fire escape illustrating its manner of use.

FIG. 2 is a vertical, sectional view, on an enlarged scale, taken substantially upon a plane passing along section line 2—2 of FIG. 1 illustrating further structural details of the device.

FIG. 3 is a transverse, sectional view, taken substantially upon a plane passing along section line 3—3 of FIG. 2 illustrating further structural details of the fire escape device.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The portable, window fire escape of the present invention is generally designated by the reference numeral 10 and includes an elongated flexible rope 12 of natural or synthetic fiber material formed in a conventional manner with a loop 14 being formed in the upper end thereof by taking the free end of the rope and folding it in a reverse direction and securing the free end to a portion of the rope by employing a metal sleeve or ferrule 16 which is permanently collapsed and permanently grips the end of the loop and the adjacent portion of the rope thereby forming a permanent loop 14 in the rope 12. The loop 14 may engage a stationary hook 18 positioned at any convenient location within a room, building, or the like, or the loop may be employed in various ways to connect the rope 12 to a rigid or stationary object within the building. For example, the loop may be engaged around the leg of a desk, bed, or positioned over any stationary object capable of holding the weight of a person as he descends down the flexible rope 12. The length of the rope 12 may be sufficient to reach ground level from various floor levels in homes, apartment buildings, office buildings, hotels, and other similar buildings, in which people occupy areas above the ground floor so that when the loop 14 is secured to a suitable support within the room or building, the other end of the rope 12 will terminate at or adjacent to ground level so that the fire escape may be employed by a person and enable the person to safely reach ground level.

The fire escape device 10 includes a sleeve assembly 20 which includes a pair of substantially semi-cylindrical members 22 and 24 having smooth interior surfaces and rounded or beveled upper and lower interior corners 26 to facilitate longitudinal movement on the rope 12 without chafing thereof. The semi-cylindrical members 22 and 24 are encircled by a substantially oval-shaped band or ring 28 which is disposed at the center of the members 22 and 24 with the member 22 being secured to the ring 28 by a pin 30 rigid therewith and extending through an aperture in the ring 28, as illustrated in FIGS. 2 and 3. As shown, the pin 30 is fixed rigidly with respect to the semi-cylindrical member 22 and extends through an aperture formed in the curved portion of the ring 28 which conforms with the external surface of the semi-cylindrical member 22 with the outer end portion of the pin 30 being riveted over, thus rigidly and fixedly securing the semi-cylindrical member 22 to the ring 28.

The opposite portion of the ring 28 is provided with a threaded nut 32 rigid therewith receiving a threaded shaft 34 having a knob, handle or wheel 36 on the outer end thereof for manual rotation thereof. The inner end of the shaft 34 is enlarged as at 38 to engage the external surface of the semi-cylindrical member 24 to move the semi-cylindrical member 24 toward the semi-cylindrical member 22 when rotated in one direction and to release the semi-cylindrical member 24 for movement away from the semi-cylindrical member 22 when moved in a counter-clockwise direction. The enlargement 38 prevents the threaded member 34 from

being completely unthreaded through the threaded nut 32 and the handle or knob 36 may be of any suitable shape and configuration and is permanently secured to the shaft 34 so that it cannot become separate therefrom, such as by having the end of the shaft riveted over as at 40, thereby forming a permanent assembly which cannot be accidentally disassembled.

Each of the semi-cylindrical members 22 and 24 is provided with an outwardly extending horizontally disposed apertured ear or lug 42 at the lower end portion thereof, as illustrated in FIG. 1. The apertured ears or lugs are arranged in opposed pairs on the edges of the semi-cylindrical members 22 and 24 and receive a relatively narrow U-shaped wire member 44 therethrough which retain the ears 42 in position alongside of each other inasmuch as the U-shaped configuration of the U-shaped wire member 44 serves to retain the ears or lugs 42 in adjacent and aligned relation. The outer ends of the legs of the U-shaped portion 44 extend outwardly as at 46 and terminate in reversely curved portions 48 which extend inwardly into horizontal portions 50 that are disposed adjacent to each other but are slightly spaced from each other. The portions 50 are received in a tubular sleeve 52 of metal or the like that is affixed in a hem 54 formed in the free ends of a belt-type harness 56. The harness is in the form of a flexible belt of a constant width from end to end with the ends of the belt 56 being secured to the wire members thus fixing the ends of the belt to the semi-cylindrical members 22 and 24.

The belt is constructed of a webbing of fabric material, leather, or any other suitable material having sufficient strength to adequately support a person when descending down the rope. The belt 56 may serve as a sling to extend under the shoulders or armpits and across the back with the arms above the belt thus enabling the person to manipulate the handle 36. Alternatively, the belt may be used as a sling under the legs so that a person may, in effect, set in the sling while he maintains control of his descent by manipulating the handle 36.

In practice, the U-shaped member 44 retains the ears 42 in alignment thus retaining semi-cylindrical members 22 and 24 in alignment and downward force exerted on the belt will cause an inward camming of the ears 42 towards each other, thus serving as a partial brake so that the semi-cylindrical members 22 and 24 will exert a frictional drag on the rope 12.

With the loop end of the rope securely anchored and the free end portion of the rope hanging down the exterior of a building wall to ground level and the sleeve assembly 20 in position adjacent the loop 14, the person using the device will move his head, arms and shoulders through the sling and loosen the handle 36 sufficiently to enable him to crawl out of a window but then tighten the handle 36 sufficiently that he will not commence his descent until he has positioned himself exteriorly of the window with his feet against the building wall to space himself away from the building wall to enable descent along the building wall without injury due to any projecting ledges, or the like. Then by slowly releasing the handle 36 and selectively tightening and loosening the handle 36, the person may safely descend along the rope at a desired rate. It is also a possibility to provide the single rope with a plurality of sleeve assemblies to enable multiple occupants of a room or the like to descend the rope in sequential relation. The size relation-

ship of the components is such that the side edges of the generally semi-cylindrical members 22 and 24 will be spaced apart sufficiently to enable the surfaces thereof to completely lock the sleeve assembly in position on the rope 12 before the edges of the members 22 and 24 contact and, in fact, may be constructed so that the members 22 and 24 are incapable of contacting each other as long the rope is in place therein and between the members 22 and 24.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A portable fire escape comprising an elongated flexible rope having an upper end capable of being anchored with respect to a building structure and having a length to depend to adjacent ground level, a sleeve assembly mounted on the rope for longitudinal movement, means connected to the sleeve assembly for supporting a person therefrom, and means on the sleeve assembly for gripping engagement with the rope to control the rate of descent along the rope, said means including a manually actuated screw-threaded member, said means supporting a person including a flexible belt having the ends thereof connected to the sleeve assembly, said sleeve assembly including a ring encircling the rope with the screw-threaded member extending radially into the ring, a pair of clamp members mounted in the ring with one of the clamp members being fixed with respect to the ring and the other clamp member being movable with respect thereto and engaged by the threaded member, each of said clamp members including an apertured lug projecting from the opposite edges of the lower end portion thereof, a substantially U-shaped member engaging each adjacent pair of lugs to retain them in assembled and substantially aligned position, each U-shaped member being connected to an end of the belt whereby downward force on the belt will cause the clamp members to move towards each other for frictional engagement with the rope.

2. The structure as defined in claim 1 wherein each of said clamp members is substantially semi-cylindrical in configuration and being of substantially greater length than the vertical height of the ring for engaging the rope over a substantial surface area thereof for controlling the rate of descent along the rope in response to rotation of the screw-threaded member.

3. The structure as defined in claim 2 wherein said rope is provided with a loop on the upper end thereof for engagement with the building.

4. The structure as defined in claim 3 wherein said belt is provided with a reinforced rigid hem in each end thereof, each U-shaped member being in the form of a wire member rigid in construction with inturned ends extending into the hem for connecting the ends of the belt to the sleeve.

5. In a fire escape device, a slide assembly adapted to be mounted on a vertically disposed rope for movement thereon, said slide assembly including an annular ring, a pair of vertically elongated clamp plates mounted within said ring for relative movement toward and away from each other for frictionally engaging the rope,

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manually actuated means on said ring engaging at least one of said clamp plates for causing relative movement therebetween, sling means for supporting engagement with a person, and means connecting the sling means to said clamp plates for retaining the clamp plates in substantially aligned condition and retaining the clamp plates in adjacent relation when the sling means is exerting a downward force thereon.

6. The structure as defined in claim 5 wherein said clamp plates have concave facing surfaces adapted to engage a rope, one of said plates being rigidly fixed to said ring and the sling means being permanently connected to said plates.

7. The fire escape device as defined in claim 5, wherein each of said clamp plates is provided with a concave inner surface for engaging a rope with one of said clamp plates being rigidly fixed to the ring, said means connecting the sling means to the clamp plates including oppositely extending lugs on each of said clamp plates, said sling means including a connecting member on each end thereof for extending through the lugs for retaining the lugs and plates in adjacent assembled relation, said connecting members including a U-shaped area engaging apertures through the lugs for retaining the lugs in aligned relation and urging the lugs towards each other when downward force is exerted on the sling means, said clamp plates being substantially longer than the ring and extending both above and below the ring, said manually actuated means on said ring including a threaded member having a handle on the outer end thereof, said threaded member being threaded through the ring with the inner end thereof engaging the plate opposite to the plate rigidly con-

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ected to the ring for frictionally clamping the rope between the plates.

8. A portable fire escape comprising an elongated flexible member having an upper end capable of being anchored with respect to a building structure and having a length to depend to adjacent ground level, a sleeve assembly mounted on the flexible member for longitudinal movement, means connected to the sleeve assembly for supporting a person therefrom, and means on the sleeve assembly for gripping engagement with the flexible member to control the rate of descent therealong, said means including a manually actuated screw-threaded member, said means supporting a person including a flexible belt having the ends thereof fixedly connected to the sleeve assembly, said sleeve assembly including a ring member encircling the flexible member with the screw-threaded member extending radially into the ring member, a pair of clamp members mounted in the ring member with one of the clamp members being fixed with respect to the ring member and the other clamp member being movable with respect thereto and engaged by the threaded member, said flexible belt having a connector member on each end thereof, each of said clamp members having oppositely projecting lugs means thereon, said connector members on said belt being connected to said lug means on said clamp members whereby downward force exerted on the connector members by a person supported by the belt will urge the clamp members toward each other for frictional engagement with the flexible member.

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